

CLAIMS

What is claimed is:

1. A gastrointestinal implant device comprising:
5 a restrictive member configured for implantation into a stomach of an animal, the restrictive member configured to divide the inner volume of the stomach into a proximal chamber and a distal chamber; and
 an anchor fixedly coupled to the stomach and removably coupled to the restrictive screen for securing the restrictive screen within the stomach.
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2. The gastrointestinal implant device of claim 1, wherein the restrictive member is a membrane having an exterior perimeter and defining an interior aperture.
3. The gastrointestinal implant device of claim 2, wherein the aperture is
15 substantially circular, having a diameter between about 1 and about 5 centimeters.
4. The gastrointestinal implant device of claim 2, wherein the restrictive member is substantially circular, having an external diameter between about 7 and about
20 20 centimeters.
5. The gastrointestinal implant device of claim 1, wherein the restrictive member is both flexible, allowing the restrictive member to deform, and non-elastic, ensuring that the surface area of the restrictive member does not vary
25 substantially.
6. The gastrointestinal implant device of claim 5, wherein the restrictive member is substantially non-permeable.

7. The gastrointestinal implant device of claim 6, wherein the non-permeable member comprises a permeable material impregnated with an impermeable coating.
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8. The gastrointestinal implant device of claim 7, wherein the permeable material is selected from the group consisting of: natural fibers; synthetic fibers; polyester fibers; and combinations thereof, and the impermeable coating is selected from the group consisting of: silicone; urethane; and combinations thereof.
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9. The gastrointestinal implant device of claim 5, wherein the restrictive member is formed from a composite material prepared using an otherwise elastic material together with a matrix of fibers impregnated therein, the resulting composite being substantially non-elastic.
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10. The gastrointestinal implant device of claim 1, wherein the restrictive member comprises a feature configured for coupling to the anchor.
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11. The gastrointestinal implant device of claim 10, wherein the feature comprises a loop.
12. The gastrointestinal implant device of claim 1, wherein the anchor is fixedly coupled to the stomach and the restrictive member is removably coupled to the anchor, allowing the restrictive member to be removed and replaced as necessary, without having to remove the anchor.
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13. The gastrointestinal implant device of claim 1, wherein the anchor includes a plurality of retractable spring clips, each spring clip configured to penetrate the muscular tissue of the stomach.
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14. The gastrointestinal implant device of claim 13, wherein the anchor includes a spring clip-retaining device configured to retain the spring clips in a non-deployed position during insertion and/or removal of the anchor.
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15. The gastrointestinal implant device of claim 14, wherein the staple-retaining device comprises a retaining ring removably coupled to the anchor and engaging the plurality of spring clips securing the plurality of spring clips in a non-deployed position.
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16. The gastrointestinal implant device of claim 15, wherein the spring-clip-retaining device comprises a retaining aperture defined by the anchor itself.
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17. The gastrointestinal implant device of claim 1, wherein the anchor is comprised of a shape-memory material.
18. The gastrointestinal implant device of claim 17, wherein the shape-memory material comprises a nickel-titanium (Ni-Ti) alloy.
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19. The gastrointestinal implant device of claim 1, wherein the anchoring ring comprises a feature configured for coupling to the restrictive screen.
20. The gastrointestinal implant device of claim 19, wherein the anchoring ring feature comprises a hook.
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21. A method of treating obesity comprising the steps of:
 providing a restrictive member;
 providing an anchor;
 fixedly coupling the anchor to an upper portion of an animal's stomach;

removably coupling the restrictive member to the anchor, the restrictive member, when coupled, dividing the inner volume of the stomach into a proximal chamber and a distal chamber and limiting the rate that food can pass therethrough.

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22. The method of claim 20, wherein the anchor comprises an annular element including a plurality of deployable spring clips attached thereto, the spring clips configured, when deployed, to secure the anchor to the stomach.

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23. A gastrointestinal implant device comprising:
- a restrictive device defining a restrictive aperture, the device configured for implantation into an upper part of a stomach of an animal;
 - a variable length elongated tube, open at both ends, and coupled at its proximal end to the restrictive device, the tube adapted to extend at least about to the pylorus to limit absorption of nutrients in the stomach, and
 - an anchor coupled to the elongated tube for securing at least a distal portion of the elongated tube.

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- 20 24. The gastrointestinal implant device of claim 23, wherein the restrictive device comprises:
- a restrictive member configured to divide the inner volume of the stomach into a proximal chamber and a distal chamber; and
 - an anchor fixedly coupled to the stomach and removably coupled to the restrictive member for securing the restrictive member within the stomach.
- 25 25. The gastrointestinal implant device of claim 23, wherein elongated tube is substantially non-permeable.

26. The gastrointestinal implant device of claim 23, wherein the elongated tube comprises a flexible sleeve.
27. The gastrointestinal implant device of claim 26, wherein the flexible sleeve is non-supported.
28. The gastrointestinal implant device of claim 26, wherein the flexible sleeve is formed of a material selected from the group consisting of: polytetrafluoroethylene (PTFE); expanded PTFE; Fluorinated Ethylene Polymer (FEP); polypropylene; polyethylene; and combinations thereof.
29. The gastrointestinal implant device of claim 26, wherein the flexible sleeve is formed of a material having a coefficient of friction of less than about 0.2.
30. The gastrointestinal implant device of claim 26, wherein the flexible sleeve comprises a coating.
31. The gastrointestinal implant device of claim 30, wherein the coating is selected from the group consisting of: silicone-based coatings; polyurethane-based coatings; and combinations thereof.
32. The gastrointestinal implant device of claim 23, wherein the elongated tube extends into the intestine.
33. The gastrointestinal implant device of claim 23, wherein the anchor secures the elongated tube within the gastrointestinal tract.
34. The gastrointestinal implant device of claim 23, wherein the anchor secures the elongated tube to the pylorus.

35. The gastrointestinal implant device of claim 23, further comprising an elongated extension tube, open at both ends, a proximal end of the extension tube substantially aligned with a distal end of the elongated tube.
- 5 36. The gastrointestinal implant device of claim 35, further comprising a connector coupled between the proximal end of the extension tube and the distal end of the elongated tube.
- 10 37. The gastrointestinal implant device of claim 36, wherein the connector comprises a hook-and-loop connector.
38. The gastrointestinal implant device of claim 23, wherein the anchor is collapsible.
- 15 39. The gastrointestinal implant device of claim 38, wherein the anchor is formed of a shape memory material.
40. The gastrointestinal implant device of claim 39, wherein the anchor is formed of a nickel-titanium (Ni-Ti) alloy.
- 20 41. The gastrointestinal implant device of claim 23, wherein the anchor is tubular anchor comprising barbs extending from the exterior surface of the anchor, the barbs configured for securing the anchor to the muscular tissue of the gastrointestinal tract.
- 25 42. The gastrointestinal implant device of claim 41, wherein the barbs are substantially bi-directional, extending outward, in opposing directions that are substantially parallel to the central axis of the tubular anchor.
- 30 43. A method of treating obesity comprising the steps of:

endoscopically placing a removable, variable restrictive device in an upper part of a stomach;

endoscopically placing a removable, variable length sleeve in the duodenum and jejunum; and

5 connecting the sleeve to the restrictive device.

44. The method of claim 43, wherein the step of placing a removable, variable restrictive device comprises:

providing a restrictive screen;

10 providing an anchor;

fixedly coupling the anchor to an upper portion of an animal's stomach;

removably coupling the restrictive screen to the anchor, the restrictive screen, when coupled, dividing the inner volume of the stomach into a proximal chamber and a distal chamber and limiting the rate that food can pass

15 therethrough.

45. A method of causing weight loss comprising the steps of:

endoscopically placing a sleeve in intestines;

anchoring the sleeve in a pylorus;

20 extending the sleeve through the stomach; and

anchoring the sleeve to a ring in the stomach.